

THE ORANGE COUNTY REGISTER

Orange County's information source since 1905 • Visit us at www.ocregister.com

Sprinkle, sprinkle, little star

From satellite to sprinkler heads, three emerging technologies could help improve water conservation

October 8, 2004

By TAMARA CHUANG

The Orange County Register

The sprinklers at John Koeller's Yorba Linda home seem to have a life of their own.

Some mornings, the automated system sprinkles for five minutes. Other mornings, it turns on for three minutes, shuts off for five minutes and then turns on again for three more minutes. And on particularly damp days, it doesn't turn on at all.

His lawn is a thirsty Kentucky bluegrass, planted before water consultant Koeller learned that over-watered lawns are a leading cause of ocean pollution. For two years, Koeller has let the sprinklers figure out when to turn on, with help from a control system that downloads weather data each night from a satellite. The evapotranspiration controller, dubbed an ET controller, adjusts watering time based on wind, humidity and other weather conditions to keep water usage and urban runoff to a minimum.

"The only way I can tell there's a difference is my water bill," said Koeller, whose costs have been cut in half.

In Orange County, over-watering is a leading contributor to urban runoff, the excess water that drains into the ocean, often after collecting animal waste, insecticide and other pollutants. Such runoff results in ocean contamination, which was a big factor in 309 pollution warnings at local beaches last year. With average annual rainfall below normal the past three years, Orange County could be facing a future of drought and water shortages.

But now, advances in technology offer new ways for businesses, local governments and homeowners to control the problem.

Last month, the Municipal Water District of Orange County launched a rebate program for ET controllers, targeting the biggest residential water users in the county. San Diego is taking satellite images of the city to determine which areas have extensive vegetation and so need more water – and which ones don't. And in Fullerton, a local professor just invented a new sprinkler head that can be adjusted so it sprays to the edge of a lawn and no farther.



LAWN AND ORDER: John Koeller's **WeatherTRAK** sprinkler system helps conserve water and reduce urban runoff.

WATER BY THE NUMBERS

223 Billions of gallons of water consumed by Orange County in 2003

100 Millions of gallons of water in O.C. wasted per day because of over-watered lawns, washing cars and sidewalks

50 Percent of O.C.'s water imported from outside the county

13 to 14 Average inches of rain each year in O.C.

8.9 Average inches of rain in Santa Ana during past three years

309 Postings at O.C. beaches in 2003 warning of possible contamination from urban runoff, storms and bird waste

“Outdoor landscaping constitutes 50 (percent) to 80 percent of water use. Anything we do to conserve a little bit is a lot in the overall scheme,” said Meena Westford, a water resources management specialist at the U.S. Department of the Interior, a sponsor of all of these water-conservation programs.

“Right now in Southern California, we’re in a drought. With population growth, where are we going to get the water? These are the technologies that are going to help us,” she said.

TITAN SPRINKLER

Instead of just stepping off the sidewalk to avoid the superfluous spray of some sprinklers, Prasada Rao wants to fix the problem. An environmental engineering professor at California State University, Fullerton, Rao began developing a newfangled sprinkler 14 months ago, seeking to tame the wayward sprays of simple sprinkler systems.

Today, his patent-pending Titan sprinkler is gaining interest from a number of water districts and commercial water companies. The sprinkler head can be adjusted to spray at different lengths in up to six directions. It targets irregularly shaped landscapes that would benefit from a sprinkler that can spray 3 feet to its left and 13 feet to its right.

Rao’s hope is to get his gadget into stores such as The Home Depot and keep prices to just a dollar or so. The Titan sprinkler head would fit on a typical sprinkler system already used in homeowners’ yards. Then, because the spray can be adjusted, homeowners would no longer waste water by spraying the sidewalk.

“Water savings varies from home to home. In terms of dollar amounts, it might not be significant. But in terms of social responsibility, everyone should conserve water. The accumulated savings would be quite significant,” Rao said.

Interest in the Titan sprinkler has sparked talks with sprinkler developers to license the technology and sell the gadget as their own.

More importantly, water conservationists view the nozzle as a potential complement to existing methods of saving water.

“(Rao) has created something where there could be six different (sprinkler) heads in one,” said Tom Ash, a water-conservation consultant who works for HydroPoint, the company behind the WeatherTRAK high-tech ET controller. “This potentially could be giant for homeowners and landscapers. It’s that good.”

SAN DIEGO LOOKING AT BIG PICTURE

Between June and July, the San Diego Water Department arranged for satellite photos to be taken of 400 square miles of the city. The goal: get a true picture of how much water the city needs to irrigate its parks, golf courses and residential landscapes.

“The basic concept is that in order to measure how much water is needed for the landscape, you need to know how much landscape you have,” said Dan Carney, landscape architect for the Water Department.

The photos were taken with a high-resolution spectral camera as part of a Geographic Information Systems, or GIS, project. Each pixel represented 2.5 meters. The multispectral technology colorized vegetation as red. The deeper the red is, the thicker the vegetation. Golf courses appeared deep red. Vacant, dirt lots showed up as almost pure white.

Carney's team now is comparing the red found in satellite photos to actual sites. Once the accuracy of the data is confirmed, a computer must classify each pixel and calculate how much water is needed to keep vegetation green.

"It's going to provide an intelligent picture," Carney said. "For example, in one area, it may have this many square feet of roofs and streets. Overlay that with terrain maps (to show) where the hills are and you're able to track (water) runoff."

The project is expected to be finished in June, Carney said.

At that time, Carney will know how much of San Diego is landscaped and requires water.

"We'll be able to say from a management point of view that we can measure those landscape areas and assign a water budget for the whole city," he said. "We can compare that with the water-use history, and the difference is what we can conserve. We anticipate that (will be) a significant amount of water that we can reduce."

The city could develop water policies and have numbers to back up any new conservation regulations. The new data also could help various city departments find ways to curb urban runoff, improve air quality with new plantings, and diminish fire hazards. "We want to derive as much value (as possible) from different departments," Carney said. "This is much more than a pretty picture."